

## SEQUENCE LISTING

<110> Napier, Johnathan A.

<120> Polyunsaturated Fatty Acid (PUFA) Elongase from *Caenorhabditis elegans*

<130> 76/7

<140> PCT/GB00/01035

<141> 2000-03-20

<160> 22

<170> PatentIn Ver. 2.1

<210> 1

<211> 27

<212> DNA

<213> *C. elegans*

<400> 1  
gcgggtacca tggtcagca tccgctc 27

<210> 2

<211> 27

<212> DNA

<213> *C. elegans*

<400> 2  
gcgggatacct tagttgttct tcttctt 27

<210> 3

<211> 27

<212> DNA

<213> *C. elegans*

<400> 3  
gcgggtacca tgccacaggg agaagtc 27

<210> 4

<211> 27

<212> DNA

<213> *C. elegans*

<400> 4  
gcgggatacct tattcaattt ttctttt 27

<210> 5

<211> 29

<212> DNA

<213> *C. elegans*

<400> 5  
gcgaattcac catgggtacg gaccaagga

29

<210> 6  
<211> 27  
<212> DNA  
<213> C. elegans

<400> 6  
gcggagctcc tactcttcc tgggacg

27

<210> 7  
<211> 876  
<212> DNA  
<213> C. elegans

<400> 7  
atggagcttg ccgagttctg gaatgatctc aacaccttca ccatctacgg accgaatcac 60  
acagatatga ccacaaaata caaatattca taccacttcc caggtgaaca ggtggcggtat 120  
ccgcagtatt ggacgatttt attccagaaa tattgggtatc attcgatcac aatatcagtt 180  
ctttattttca ttttaattaa ggtgattcaa aagtttatgg agaatcgaaa accatttact 240  
ttgaaatacc cattgattct ttggaatgga gctcttcgag cattcagtat aattgccaca 300  
ttgcggttct ctattgatcc tctacgatca ctatatgctg aaggattcta caaaactctg 360  
tgctattcgt gtaatccaac tgatgtggct gcattttgga gctttgcatt cgctctttcc 420  
aagattgttg aacttggaga cactatgttc attattttga gaaaacggcc attgatcttt 480  
ttacactact atcatcatgc agcagtgtta atctacactg tccattctgg tgccgagcat 540  
actgcagctg gtcgtttcta catcctaattg aactacttcg cacattctct catgtatact 600  
tactacacag tttctgccat gggatacaga ttaccgaaat ggggtatcaat gactgtcaca 660  
actgttcaaa caactcaaat gtttagctgga gtcggaataa cttggatggt gtacaaagt 720  
aaaactgaat acaagcttcc ttgtcaacaa tccgtagcca atttgtatct cgcattcgtc 780  
atctatgtca catttgccat tcttttcatt caattcttcg tcaaggcata cattatcaag 840  
tcgtcgaaga agtcgaaatc ggtgaagaac gaataa 876

<210> 8  
<211> 1308  
<212> DNA  
<213> C. elegans

<400> 8  
atggcaaat acgactacaa tccgaagtat gggttagaaa attacagcat attccttccc 60  
tttgagacat cttttgatgc atttcgatcg acaacatgga tgcaaatca ctggtatcaa 120  
tcaattacag catctgtcgt gtatgtagcc gtcattttta caggaaagaa ggtgggttctc 180  
atctacaaa aatcacgagt tattactttt gagtctagcc ttcagaatgc aattaagaat 240  
cgaaaccgaa aatcacttaa tagttctcaa atgtttcaga ttatggaaaa gtacaagccc 300  
ttccaactgg acacaccact ctctgtctgg aattcatttt tagccatttt ctcaattctc 360  
gggttctctc gaatgacacc tgaatttgta tggagttggt cagcagaagg aaactcattc 420  
aaatattcaa tttgtcattc atcttatgct caaggagtca ctggtttctg gactgaacaa 480  
ttcgcaatga gcaaaacttt cgagctcatc gacacaatct tcatcgttct tcgtaaactg 540  
ccactcatct tcttctactg gtatcatcat gtaactgtta tgatctacac atggcacgcg 600  
tacaaggatc aactgcacg aggcaggtgg ttcatgttga tgaattatgg agttcatgct 660  
cttatgtatt cctactatgc tcttcgttct ctgaaattcc gtcttccaaa acaaatggca 720

atggttggtta	ctactctcca	acttgetcaa	atggttatgg	gagtaatcat	cggagtcact	780
gtctaccgta	tcaagtcate	gggtgaatac	tgccaacaga	catgggacaa	tttgggatta	840
tgctttggag	tttatttcac	atatttcctt	cttttcgcca	acttcttcta	ccatgcatat	900
gttaagaaaa	acaaccgtac	agtaaattat	gaaaataatt	caaaaaattt	ccccgatctc	960
gttttaattt	acctgagaaa	aaaggtttca	agaaaatcga	aaaatcggca	atgttcagaa	1020
aataattata	aaattcaatt	ttcatcaaat	tttggttaatg	ttgatggaaa	aaaacataag	1080
aaaacatatg	aacttattct	tccaagaaga	aaaatgacca	caatttttaac	ttttctattt	1140
ggaaaaaatc	gaattttttc	gaaatatcag	aaaaatcgaa	aaaacatttc	gattcctgtt	1200
gatttcgaaa	ttctggagcc	aaaagaagat	atcaatgcta	acatcgctga	gccatccatc	1260
acaacgaggt	ccgccgccgc	acgaagaaaa	gttcaaaaag	ctgattag		1308

<210> 9

<211> 825

<212> DNA

<213> C. elegans

<400> 9

atggcagcag	cacaaacaag	tccagcagcc	acgctcgtcg	atgttttgac	aaaaccatgg	60
agtctggatc	agactgattc	ttacatgtct	acatttgtac	cattatccta	taaaatcatg	120
attggttata	tcgtcaccat	ctacttcggg	caaaaattaa	tggtcacag	aaaaccattc	180
gatctccaaa	atacacttgc	tctctggaac	ttcgggtttt	caactgttctc	gggaatcgcc	240
gcctataagc	ttattccaga	actattcgga	gttttcatga	aggacgggtt	tgctcgcttc	300
tactgtcaaa	acgagaacta	ctacaccgat	gcacactg	gattctgggg	ctgggccttt	360
gtgatgtcga	aagctccaga	actaggggat	actatgttct	tggtccttcg	taaaaaacca	420
gttatcttca	tgcaactgga	tcatcatgcc	ctcacatttg	tctacgcagt	agtcacatac	480
tctgagcatc	aggcatgggc	tcgttgggtc	ttggctctca	accttgccgt	ccacactggt	540
atgtatttct	acttcgccgt	tcgcgccttg	aacatccaaa	ctccacgccc	agtggcaaa	600
ttcatcacta	ctattcaaat	tgtccaattt	gtcatctcat	gctacatttt	tgggcatttg	660
gtattcatta	agtctgctga	ttctgttctt	ggttgcgctg	ttagctggaa	tgtgctatcg	720
atcgaggagc	tcatgtacat	cagttatttg	ttcctttttg	ccaagttctt	ctacaaggcc	780
tacattcaaa	aacgctcacc	aaccaaaaacc	agcaagcagg	agtag		825

<210> 10

<211> 861

<212> DNA

<213> C. elegans

<400> 10

atgtcatcgg	acgatcgtgg	cactagaacc	ttcaagatga	tgatcaaat	tcttgaaca	60
aacttcactt	atgaaggtgc	caaagaagtt	gctcgaggcc	ttgaaggttt	ctcagcaaa	120
cttgccgtcg	gatataattg	cactattttt	ggactgaaat	attatatgaa	agaccgaaaa	180
gccttcgatc	tcagtactcc	attaaacatt	tggaatggta	ttctttcgac	attcagctta	240
ttgggattct	tattcacttt	tcctactttg	ttatcagtta	tcagaaagga	tggatttagt	300
cacacctatt	cccatgtctc	tgagctttac	actgacagta	cctctggata	ttggatcttc	360
ctttgggtta	tctcaaagat	tccggaactt	ttggatacag	tattcattgt	tcttcgcaag	420
agaccactta	ttttcatgca	ctggtaccat	cacgcattga	ccggttacta	tgctctgtc	480
tgctaccatg	aggatgctgt	ccatatgggt	tggttgtgat	ggatgaatta	tattattcat	540
gcattcatgt	atggatacta	tcttctgaaa	tctctgaaag	ttccaattcc	accatcagtt	600
gctcaagcaa	tcaccacatc	tcaaaggtt	caattcgcag	ttgccatttt	cgcacaagtt	660
catgtttcct	ataaacacta	tggtgagggg	gttgaaggat	tagcctactc	gttcagagga	720
acagctatcg	gatttttcat	gcttactacc	tacttctatc	tatggattca	attctacaaa	780
gagcactatc	ttaagaatgg	aggcaaaaag	tacaatttgg	caaaggatca	ggcaaaaact	840
caaacaaaga	aggctaacta	a				861

<210> 11  
 <211> 825  
 <212> DNA  
 <213> C. elegans

<400> 11  
 atgccacagg gagaagtctc attctttgag gtgctgacaa ctgctccatt cagtcatgag 60  
 ctctcaaaaa agcatattgc acagactcag tatgctgctt tctggatctc aatggcatat 120  
 gttgtcgtta tttttgggct caaggctgtc atgacaaacc gaaaaccatt tgatctcacg 180  
 ggaccactga atctctggaa tgcgggtctt gctattttct caactctcgg atcacttgcc 240  
 actacatttg gacttctcca cgagttcttc agccgtggat ttttcgaatc ttacattcac 300  
 atcggagact tttataatgg acttttctga atgttcacat ggcttttctg tctctcaaaa 360  
 gttgctgaat tcggagatac acttttttatt attcttcgta aaaagccatt gatgttcctt 420  
 cattggtatc atcatgtgct tacaatgaat tatgctttta tgtcatttga agctaatttg 480  
 ggatttaata cttggattac atggatgaat ttctcagttc actcaattat gtatggatat 540  
 tatatgcttc gttcttttgg tgtcaagggt ccagcatgga ttgccaagaa tattacaaca 600  
 atgcaaattc ttcaattcgt tattactcat ttcattcttt tccacgttgg atatttgga 660  
 gttactggac aatctgttga ctcaactcca ggatattatt ggttctgcct tctcatggaa 720  
 atctcttatg tcgttctgtt cggaaacttc tactatcaat catacatcaa gggaggtggc 780  
 aagaagttaa atgcagagaa gaagactgaa aagaaaattg aataa 825

<210> 12  
 <211> 846  
 <212> DNA  
 <213> C. elegans

<400> 12  
 atgtatttga attatttcgc gacggaaatc ttccatcgta gtgcgggtttg tgaaacagaa 60  
 gcttgtcgct cgtcaaaaat aatgattgct gacgtgttca aatggaaatt cgatgcaaac 120  
 gaattgtgga gtcttttaac gaatcaggat gaagttttcc cgcataattag agcacggcga 180  
 ttcattcaag aacatttttg tctattcgtc cagatggcaa ttgcatatgt cattttggtg 240  
 ttctcaatca aaaggttcac gagggatcgt gaaccatttc aactcaccac agctcttcgt 300  
 ctctggaaact tcttctctc cgtcttctca atttatgggt cctggacaat gtttccattt 360  
 atgggttcaac aaataagact ttatggtctc tacggatgtg gatgcgaagc actttcaaac 420  
 cttccgagtc aagcagaata ttggcttttc ctgacgatct tgtccaaagc tgtggagtgt 480  
 gttgatacat ttttcttgggt tctccgaaa aaaccactca tcttcttaca ctggtatcat 540  
 catatggcaa catttgtctt cttctgcagt aattaccga ctccatcgtc acaatcacgc 600  
 gtcggagtta tcgtcaacct gttcgtgcat gccttcatgt acccatacta tttcaccga 660  
 tcaatgaaca tcaaagtcc tgcgaaaatt tcaatggctg ttacagttct tcaattgact 720  
 caattcatgt gctttatcta tggatgtact ctcatgtact actcgttggc cactaatcag 780  
 gcacgatacc cctcaaatac acctgcgaca ctccaatgtt tgtcctacac tctacatttg 840  
 ctttga 846

<210> 13  
 <211> 866  
 <212> DNA  
 <213> C. elegans

<400> 13  
 atggctcagc atccgctcgt tcaacggctt ctcatgtca aattcgacac gaaacgattt 60  
 gtggctattg ctactcatgg gccaaagaat ttccctgacg cagaaggctg caagttcttt 120

gctgatcact ttgatgttac tattcaggct tcaatcctgt acatggctgt tgtgttcgga 180  
 acaaaatggt tcatgcgtaa tcgtcaacca ttccaattga ctattccact caacatctgg 240  
 aatttcatcc tcgccgcatt ttccatcgca ggagctgtca aaatgacccc agagttcttt 300  
 ggaaccattg ccaacaaagg aattgtcgat cctactgcaa agtggttgat ttcacgaaag 360  
 gagagaatgg atactgggtg tggctcttca tggcttccaa acttttcgaa cttgttgaca 420  
 ccatcttctt ggttctccgt aaacgtccac tcatgttcct tcaactggat caccatattc 480  
 tcaccatgat ctacgcctgg tactctcatc cattgacccc aggattcaac agatacggaa 540  
 tttatcttaa ctttgcgtc cacgccttca tgtactctta ctacttcctt cgctcgatga 600  
 agattcgcgt gccaggattc atcgcccaag ctatcacatc tcttcaaate gttcaattca 660  
 tcactctctg cgccgttctt gctcatcttg gttatctcat gcacttcacc aatgccaact 720  
 gtgatttcga gccatcagta ttcaagctcg cagttttcat ggacacaaca tacttggctc 780  
 ttttcgtcaa cttcttcctc caatcatatg ttctccgcgg aggaaaagac aagtacaagg 840  
 cagtgcctaaa gaagaagaac aactaa 866

<210> 14

<211> 801

<212> DNA

<213> C. elegans

<400> 14

atgtcggccg aagtgtccga acgattcaaa gtttggacag gaaacaatga gaccatcatc 60  
 tattccccat tcgagtaaga ttccacgttg ctcatcgagt catgtcgggt tacttatcag 120  
 ctgcttatat tattgcgaca aatttattac agagatatat ggagtcacgg aaacctaaaa 180  
 cttttactag catggaacgg ttttttggca gtgttcagta ttatgggtac atggagattt 240  
 ggaatcgaat tctacgatgc tgttttcaga agaggcttca tcgattcgat ctgcctggct 300  
 gtaaatccac gtccaccgtc cgcattcttg gcatgcatgt tcgctctatc gaaaatcgcc 360  
 gagtttgggg acacgatgtt cttggtgctg aggaaacggc cggttatatt ccttcactgg 420  
 tatcatcacg ctggtgttct gatcctttct tggcatgctg caatcgaact cacagctcca 480  
 ggacgctggt ttatttttat gaactatttg gtgcattcaa taatgtatac atactacgca 540  
 ataacatcaa tcggctatcg tcttcccaaa atcgtttcaa tgactgttac attccttcaa 600  
 actcttcaaa tgcctatttg tgtcagcatt tcttgcattg tgctttattt gaagcttaat 660  
 ggagagatgt gccacaatc ctacgacaat ctggcggtga gcttcggaat ctacgcctca 720  
 ttcttggtgc tattctccag tttcttcaac aatgcatatt tggtaaaaaa ggacaagaaa 780  
 cccgatgtga agaaggatta a 801

<210> 15

<211> 291

<212> PRT

<213> C. elegans

<400> 15

Met Glu Leu Ala Glu Phe Trp Asn Asp Leu Asn Thr Phe Thr Ile Tyr  
 1 5 10 15

Gly Pro Asn His Thr Asp Met Thr Thr Lys Tyr Lys Tyr Ser Tyr His  
 20 25 30

Phe Pro Gly Glu Gln Val Ala Asp Pro Gln Tyr Trp Thr Ile Leu Phe  
 35 40 45

Gln Lys Tyr Trp Tyr His Ser Ile Thr Ile Ser Val Leu Tyr Phe Ile  
 50 55 60

Leu Ile Lys Val Ile Gln Lys Phe Met Glu Asn Arg Lys Pro Phe Thr  
 65 70 75 80  
 Leu Lys Tyr Pro Leu Ile Leu Trp Asn Gly Ala Leu Ala Ala Phe Ser  
 85 90 95  
 Ile Ile Ala Thr Leu Arg Phe Ser Ile Asp Pro Leu Arg Ser Leu Tyr  
 100 105 110  
 Ala Glu Gly Phe Tyr Lys Thr Leu Cys Tyr Ser Cys Asn Pro Thr Asp  
 115 120 125  
 Val Ala Ala Phe Trp Ser Phe Ala Phe Ala Leu Ser Lys Ile Val Glu  
 130 135 140  
 Leu Gly Asp Thr Met Phe Ile Ile Leu Arg Lys Arg Pro Leu Ile Phe  
 145 150 155 160  
 Leu His Tyr Tyr His His Ala Ala Val Leu Ile Tyr Thr Val His Ser  
 165 170 175  
 Gly Ala Glu His Thr Ala Ala Gly Arg Phe Tyr Ile Leu Met Asn Tyr  
 180 185 190  
 Phe Ala His Ser Leu Met Tyr Thr Tyr Tyr Thr Val Ser Ala Met Gly  
 195 200 205  
 Tyr Arg Leu Pro Lys Trp Val Ser Met Thr Val Thr Thr Val Gln Thr  
 210 215 220  
 Thr Gln Met Leu Ala Gly Val Gly Ile Thr Trp Met Val Tyr Lys Val  
 225 230 235 240  
 Lys Thr Glu Tyr Lys Leu Pro Cys Gln Gln Ser Val Ala Asn Leu Tyr  
 245 250 255  
 Leu Ala Phe Val Ile Tyr Val Thr Phe Ala Ile Leu Phe Ile Gln Phe  
 260 265 270  
 Phe Val Lys Ala Tyr Ile Ile Lys Ser Ser Lys Lys Ser Lys Ser Val  
 275 280 285  
 Lys Asn Glu  
 290

<210> 16  
 <211> 435  
 <212> PRT  
 <213> C. elegans

<400> 16  
 Met Ala Lys Tyr Asp Tyr Asn Pro Lys Tyr Gly Leu Glu Asn Tyr Ser  
 1 5 10 15

Ile	Phe	Leu	Pro	Phe	Glu	Thr	Ser	Phe	Asp	Ala	Phe	Arg	Ser	Thr	Thr	20	25	30	
Trp	Met	Gln	Asn	His	Trp	Tyr	Gln	Ser	Ile	Thr	Ala	Ser	Val	Val	Tyr	35	40	45	
Val	Ala	Val	Ile	Phe	Thr	Gly	Lys	Lys	Val	Val	Leu	Ile	Tyr	Lys	Lys	50	55	60	
Ser	Arg	Val	Ile	Thr	Phe	Glu	Ser	Ser	Leu	Gln	Asn	Ala	Ile	Lys	Asn	65	70	75	80
Arg	Asn	Arg	Lys	Ser	Leu	Asn	Ser	Ser	Gln	Met	Phe	Gln	Ile	Met	Glu	85	90	95	
Lys	Tyr	Lys	Pro	Phe	Gln	Leu	Asp	Thr	Pro	Leu	Phe	Val	Trp	Asn	Ser	100	105	110	
Phe	Leu	Ala	Ile	Phe	Ser	Ile	Leu	Gly	Phe	Leu	Arg	Met	Thr	Pro	Glu	115	120	125	
Phe	Val	Trp	Ser	Trp	Ser	Ala	Glu	Gly	Asn	Ser	Phe	Lys	Tyr	Ser	Ile	130	135	140	
Cys	His	Ser	Ser	Tyr	Ala	Gln	Gly	Val	Thr	Gly	Phe	Trp	Thr	Glu	Gln	145	150	155	160
Phe	Ala	Met	Ser	Lys	Leu	Phe	Glu	Leu	Ile	Asp	Thr	Ile	Phe	Ile	Val	165	170	175	
Leu	Arg	Lys	Arg	Pro	Leu	Ile	Phe	Leu	His	Trp	Tyr	His	His	Val	Thr	180	185	190	
Val	Met	Ile	Tyr	Thr	Trp	His	Ala	Tyr	Lys	Asp	His	Thr	Ala	Ser	Gly	195	200	205	
Arg	Trp	Phe	Ile	Trp	Met	Asn	Tyr	Gly	Val	His	Ala	Leu	Met	Tyr	Ser	210	215	220	
Tyr	Tyr	Ala	Leu	Arg	Ser	Leu	Lys	Phe	Arg	Leu	Pro	Lys	Gln	Met	Ala	225	230	235	240
Met	Val	Val	Thr	Thr	Leu	Gln	Leu	Ala	Gln	Met	Val	Met	Gly	Val	Ile	245	250	255	
Ile	Gly	Val	Thr	Val	Tyr	Arg	Ile	Lys	Ser	Ser	Gly	Glu	Tyr	Cys	Gln	260	265	270	
Gln	Thr	Trp	Asp	Asn	Leu	Gly	Leu	Cys	Phe	Gly	Val	Tyr	Phe	Thr	Tyr	275	280	285	
Phe	Leu	Leu	Phe	Ala	Asn	Phe	Phe	Tyr	His	Ala	Tyr	Val	Lys	Lys	Asn	290	295	300	

Asn Arg Thr Val Asn Tyr Glu Asn Asn Ser Lys Asn Phe Pro Asp Leu  
305 310 315 320

Val Leu Ile Tyr Leu Arg Lys Lys Val Ser Arg Lys Ser Lys Asn Arg  
325 330 335

Gln Cys Ser Glu Asn Asn Tyr Lys Ile Gln Phe Ser Ser Asn Phe Val  
340 345 350

Asn Val Asp Gly Lys Lys His Lys Lys Thr Tyr Glu Leu Ile Leu Pro  
355 360 365

Arg Arg Lys Met Thr Thr Ile Leu Thr Phe Leu Phe Gly Lys Asn Arg  
370 375 380

Ile Phe Ser Lys Tyr Gln Lys Asn Arg Lys Asn Ile Ser Ile Pro Val  
385 390 395 400

Asp Phe Glu Ile Leu Glu Pro Lys Glu Asp Ile Asn Ala Asn Ile Ala  
405 410 415

Glu Pro Ser Ile Thr Thr Arg Ser Ala Ala Ala Arg Arg Lys Val Gln  
420 425 430

Lys Ala Asp  
435

<210> 17  
<211> 274  
<212> PRT  
<213> C. elegans

<400> 17  
Met Ala Ala Ala Gln Thr Ser Pro Ala Ala Thr Leu Val Asp Val Leu  
1 5 10 15

Thr Lys Pro Trp Ser Leu Asp Gln Thr Asp Ser Tyr Met Ser Thr Phe  
20 25 30

Val Pro Leu Ser Tyr Lys Ile Met Ile Gly Tyr Leu Val Thr Ile Tyr  
35 40 45

Phe Gly Gln Lys Leu Met Ala His Arg Lys Pro Phe Asp Leu Gln Asn  
50 55 60

Thr Leu Ala Leu Trp Asn Phe Gly Phe Ser Leu Phe Ser Gly Ile Ala  
65 70 75 80

Ala Tyr Lys Leu Ile Pro Glu Leu Phe Gly Val Phe Met Lys Asp Gly  
85 90 95

Phe Val Ala Ser Tyr Cys Gln Asn Glu Asn Tyr Tyr Thr Asp Ala Ser  
100 105 110



Thr Gly Phe Trp Gly Trp Ala Phe Val Met Ser Lys Ala Pro Glu Leu  
115 120 125

Gly Asp Thr Met Phe Leu Val Leu Arg Lys Lys Pro Val Ile Phe Met  
130 135 140

His Trp Tyr His His Ala Leu Thr Phe Val Tyr Ala Val Val Thr Tyr  
145 150 155 160

Ser Glu His Gln Ala Trp Ala Arg Trp Ser Leu Ala Leu Asn Leu Ala  
165 170 175

Val His Thr Val Met Tyr Phe Tyr Phe Ala Val Arg Ala Leu Asn Ile  
180 185 190

Gln Thr Pro Arg Pro Val Ala Lys Phe Ile Thr Thr Ile Gln Ile Val  
195 200 205

Gln Phe Val Ile Ser Cys Tyr Ile Phe Gly His Leu Val Phe Ile Lys  
210 215 220

Ser Ala Asp Ser Val Pro Gly Cys Ala Val Ser Trp Asn Val Leu Ser  
225 230 235 240

Ile Gly Gly Leu Met Tyr Ile Ser Tyr Leu Phe Leu Phe Ala Lys Phe  
245 250 255

Phe Tyr Lys Ala Tyr Ile Gln Lys Arg Ser Pro Thr Lys Thr Ser Lys  
260 265 270

Gln Glu

<210> 18  
<211> 286  
<212> PRT  
<213> C. elegans

<400> 18  
Met Ser Ser Asp Asp Arg Gly Thr Arg Thr Phe Lys Met Met Asp Gln  
1 5 10 15

Ile Leu Gly Thr Asn Phe Thr Tyr Glu Gly Ala Lys Glu Val Ala Arg  
20 25 30

Gly Leu Glu Gly Phe Ser Ala Lys Leu Ala Val Gly Tyr Ile Ala Thr  
35 40 45

Ile Phe Gly Leu Lys Tyr Tyr Met Lys Asp Arg Lys Ala Phe Asp Leu  
50 55 60

Ser Thr Pro Leu Asn Ile Trp Asn Gly Ile Leu Ser Thr Phe Ser Leu

65					70						75				80
Leu	Gly	Phe	Leu	Phe	Thr	Phe	Pro	Thr	Leu	Leu	Ser	Val	Ile	Arg	Lys
				85					90					95	
Asp	Gly	Phe	Ser	His	Thr	Tyr	Ser	His	Val	Ser	Glu	Leu	Tyr	Thr	Asp
			100					105					110		
Ser	Thr	Ser	Gly	Tyr	Trp	Ile	Phe	Leu	Trp	Val	Ile	Ser	Lys	Ile	Pro
		115					120					125			
Glu	Leu	Leu	Asp	Thr	Val	Phe	Ile	Val	Leu	Arg	Lys	Arg	Pro	Leu	Ile
	130					135					140				
Phe	Met	His	Trp	Tyr	His	His	Ala	Leu	Thr	Gly	Tyr	Tyr	Ala	Leu	Val
145					150					155					160
Cys	Tyr	His	Glu	Asp	Ala	Val	His	Met	Val	Trp	Val	Val	Trp	Met	Asn
				165					170					175	
Tyr	Ile	Ile	His	Ala	Phe	Met	Tyr	Gly	Tyr	Tyr	Leu	Leu	Lys	Ser	Leu
			180					185					190		
Lys	Val	Pro	Ile	Pro	Pro	Ser	Val	Ala	Gln	Ala	Ile	Thr	Thr	Ser	Gln
		195					200					205			
Met	Val	Gln	Phe	Ala	Val	Ala	Ile	Phe	Ala	Gln	Val	His	Val	Ser	Tyr
	210					215					220				
Lys	His	Tyr	Val	Glu	Gly	Val	Glu	Gly	Leu	Ala	Tyr	Ser	Phe	Arg	Gly
225					230					235					240
Thr	Ala	Ile	Gly	Phe	Phe	Met	Leu	Thr	Thr	Tyr	Phe	Tyr	Leu	Trp	Ile
				245					250					255	
Gln	Phe	Tyr	Lys	Glu	His	Tyr	Leu	Lys	Asn	Gly	Gly	Lys	Lys	Tyr	Asn
			260					265					270		
Leu	Ala	Lys	Asp	Gln	Ala	Lys	Thr	Gln	Thr	Lys	Lys	Ala	Asn		
		275					280					285			

<210> 19  
 <211> 274  
 <212> PRT  
 <213> C. elegans

<400> 19  
 Met Pro Gln Gly Glu Val Ser Phe Phe Glu Val Leu Thr Thr Ala Pro  
 1 5 10 15  
 Phe Ser His Glu Leu Ser Lys Lys His Ile Ala Gln Thr Gln Tyr Ala  
 20 25 30

Ala Phe Trp Ile Ser Met Ala Tyr Val Val Val Ile Phe Gly Leu Lys  
35 40 45

Ala Val Met Thr Asn Arg Lys Pro Phe Asp Leu Thr Gly Pro Leu Asn  
50 55 60

Leu Trp Asn Ala Gly Leu Ala Ile Phe Ser Thr Leu Gly Ser Leu Ala  
65 70 75 80

Thr Thr Phe Gly Leu Leu His Glu Phe Phe Ser Arg Gly Phe Phe Glu  
85 90 95

Ser Tyr Ile His Ile Gly Asp Phe Tyr Asn Gly Leu Ser Gly Met Phe  
100 105 110

Thr Trp Leu Phe Val Leu Ser Lys Val Ala Glu Phe Gly Asp Thr Leu  
115 120 125

Phe Ile Ile Leu Arg Lys Lys Pro Leu Met Phe Leu His Trp Tyr His  
130 135 140

His Val Leu Thr Met Asn Tyr Ala Phe Met Ser Phe Glu Ala Asn Leu  
145 150 155 160

Gly Phe Asn Thr Trp Ile Thr Trp Met Asn Phe Ser Val His Ser Ile  
165 170 175

Met Tyr Gly Tyr Tyr Met Leu Arg Ser Phe Gly Val Lys Val Pro Ala  
180 185 190

Trp Ile Ala Lys Asn Ile Thr Thr Met Gln Ile Leu Gln Phe Val Ile  
195 200 205

Thr His Phe Ile Leu Phe His Val Gly Tyr Leu Ala Val Thr Gly Gln  
210 215 220

Ser Val Asp Ser Thr Pro Gly Tyr Tyr Trp Phe Cys Leu Leu Met Glu  
225 230 235 240

Ile Ser Tyr Val Val Leu Phe Gly Asn Phe Tyr Tyr Gln Ser Tyr Ile  
245 250 255

Lys Gly Gly Gly Lys Lys Phe Asn Ala Glu Lys Lys Thr Glu Lys Lys  
260 265 270

Ile Glu

<210> 20  
<211> 281  
<212> PRT  
<213> C. elegans

<400> 20

Met Tyr Leu Asn Tyr Phe Ala Thr Glu Ile Phe His Arg Ser Ala Val  
1 5 10 15

Cys Glu Thr Glu Ala Cys Arg Ser Ser Lys Ile Met Ile Ala Asp Val  
20 25 30

Phe Lys Trp Lys Phe Asp Ala Asn Glu Leu Trp Ser Leu Leu Thr Asn  
35 40 45

Gln Asp Glu Val Phe Pro His Ile Arg Ala Arg Arg Phe Ile Gln Glu  
50 55 60

His Phe Gly Leu Phe Val Gln Met Ala Ile Ala Tyr Val Ile Leu Val  
65 70 75 80

Phe Ser Ile Lys Arg Phe Met Arg Asp Arg Glu Pro Phe Gln Leu Thr  
85 90 95

Thr Ala Leu Arg Leu Trp Asn Phe Phe Leu Ser Val Phe Ser Ile Tyr  
100 105 110

Gly Ser Trp Thr Met Phe Pro Phe Met Val Gln Gln Ile Arg Leu Tyr  
115 120 125

Gly Leu Tyr Gly Cys Gly Cys Glu Ala Leu Ser Asn Leu Pro Ser Gln  
130 135 140

Ala Glu Tyr Trp Leu Phe Leu Thr Ile Leu Ser Lys Ala Val Glu Phe  
145 150 155 160

Val Asp Thr Phe Phe Leu Val Leu Arg Lys Lys Pro Leu Ile Phe Leu  
165 170 175

His Trp Tyr His His Met Ala Thr Phe Val Phe Phe Cys Ser Asn Tyr  
180 185 190

Pro Thr Pro Ser Ser Gln Ser Arg Val Gly Val Ile Val Asn Leu Phe  
195 200 205

Val His Ala Phe Met Tyr Pro Tyr Tyr Phe Thr Arg Ser Met Asn Ile  
210 215 220

Lys Val Pro Ala Lys Ile Ser Met Ala Val Thr Val Leu Gln Leu Thr  
225 230 235 240

Gln Phe Met Cys Phe Ile Tyr Gly Cys Thr Leu Met Tyr Tyr Ser Leu  
245 250 255

Ala Thr Asn Gln Ala Arg Tyr Pro Ser Asn Thr Pro Ala Thr Leu Gln  
260 265 270

Cys Leu Ser Tyr Thr Leu His Leu Leu  
275 280

0993645-091601

<210> 21  
 <211> 288  
 <212> PRT  
 <213> C. elegans

<400> 21

Met	Ala	Gln	His	Pro	Leu	Val	Gln	Arg	Leu	Leu	Asp	Val	Lys	Phe	Asp
1				5					10					15	
Thr	Lys	Arg	Phe	Val	Ala	Ile	Ala	Thr	His	Gly	Pro	Lys	Asn	Phe	Pro
			20					25					30		
Asp	Ala	Glu	Gly	Arg	Lys	Phe	Phe	Ala	Asp	His	Phe	Asp	Val	Thr	Ile
		35					40					45			
Gln	Ala	Ser	Ile	Leu	Tyr	Met	Val	Val	Val	Phe	Gly	Thr	Lys	Trp	Phe
	50					55					60				
Met	Arg	Asn	Arg	Gln	Pro	Phe	Gln	Leu	Thr	Ile	Pro	Leu	Asn	Ile	Trp
65					70					75					80
Asn	Phe	Ile	Leu	Ala	Ala	Phe	Ser	Ile	Ala	Gly	Ala	Val	Lys	Met	Thr
				85					90					95	
Pro	Glu	Phe	Phe	Gly	Thr	Ile	Ala	Asn	Lys	Gly	Ile	Val	Ala	Ser	Tyr
			100					105					110		
Cys	Lys	Val	Phe	Asp	Phe	Thr	Lys	Gly	Glu	Asn	Gly	Tyr	Trp	Val	Trp
		115					120					125			
Leu	Phe	Met	Ala	Ser	Lys	Leu	Phe	Glu	Leu	Val	Asp	Thr	Ile	Phe	Leu
	130					135					140				
Val	Leu	Arg	Lys	Arg	Pro	Leu	Met	Phe	Leu	His	Trp	Tyr	His	His	Ile
145					150					155					160
Leu	Thr	Met	Ile	Tyr	Ala	Trp	Tyr	Ser	His	Pro	Leu	Thr	Pro	Gly	Phe
			165						170					175	
Asn	Arg	Tyr	Gly	Ile	Tyr	Leu	Asn	Phe	Val	Val	His	Ala	Phe	Met	Tyr
			180					185					190		
Ser	Tyr	Tyr	Phe	Leu	Arg	Ser	Met	Lys	Ile	Arg	Val	Pro	Gly	Phe	Ile
		195					200					205			
Ala	Gln	Ala	Ile	Thr	Ser	Leu	Gln	Ile	Val	Gln	Phe	Ile	Ile	Ser	Cys
	210					215					220				
Ala	Val	Leu	Ala	His	Leu	Gly	Tyr	Leu	Met	His	Phe	Thr	Asn	Ala	Asn
225					230					235					240
Cys	Asp	Phe	Glu	Pro	Ser	Val	Phe	Lys	Leu	Ala	Val	Phe	Met	Asp	Thr
				245					250					255	

Thr Tyr Leu Ala Leu Phe Val Asn Phe Phe Leu Gln Ser Tyr Val Leu  
 260 265 270

Arg Gly Gly Lys Asp Lys Tyr Lys Ala Val Pro Lys Lys Lys Asn Asn  
 275 280 285

<210> 22  
 <211> 269  
 <212> PRT  
 <213> C. elegans

<400> 22  
 Met Ser Ala Glu Val Ser Glu Arg Phe Lys Val Trp Thr Gly Asn Asn  
 1 5 10 15

Glu Thr Ile Ile Tyr Ser Pro Phe Glu Tyr Asp Ser Thr Leu Leu Ile  
 20 25 30

Glu Ser Cys Arg Cys Thr Tyr Gln Leu Leu Ile Leu Leu Arg Gln Ile  
 35 40 45

Tyr Tyr Arg Asp Ile Trp Ser His Gly Asn Leu Lys Ala Cys Asp Xaa  
 50 55 60

Leu Leu Leu Ala Trp Asn Gly Phe Leu Ala Val Phe Ser Ile Met Gly  
 65 70 75 80

Thr Trp Arg Phe Gly Ile Glu Phe Tyr Asp Ala Val Phe Arg Xaa Gly  
 85 90 95

Phe Ile Xaa Ser Ile Cys Leu Ala Val Asn Pro Arg Ser Pro Ser Ala  
 100 105 110

Phe Trp Ala Cys Met Phe Ala Leu Ser Lys Ile Ala Glu Phe Gly Asp  
 115 120 125

Thr Met Phe Leu Val Leu Arg Lys Arg Pro Val Ile Phe Leu His Trp  
 130 135 140

Tyr His His Ala Val Val Leu Ile Leu Ser Trp His Ala Ala Ile Glu  
 145 150 155 160

Leu Thr Ala Pro Gly Arg Trp Phe Ile Phe Met Asn Tyr Leu Val His  
 165 170 175

Ser Ile Met Tyr Thr Tyr Tyr Ala Ile Thr Ser Ile Gly Tyr Arg Xaa  
 180 185 190

Pro Lys Ile Val Ser Met Thr Val Thr Phe Leu Gln Thr Leu Gln Met

195	200	205
Leu Ile Gly Val Ser Ile Ser Cys Ile Val Leu Tyr Leu Lys Leu Asn		
210	215	220
Gly Glu Met Cys Gln Gln Ser Tyr Asp Asn Leu Ala Leu Ser Phe Gly		
225	230	235
Ile Tyr Ala Ser Phe Leu Val Leu Ser Ser Phe Phe Asn Asn Ala Tyr		
245	250	255
Leu Val Lys Lys Asp Lys Lys Pro Asp Val Lys Lys Asp		
260	265	

0003645 091801  
 T08T60" 5489E660